

100% hits SID4 GenBank & GeneSeq & *Pats*

LOCUS HVDNAHOR3 1859 bp DNA linear PLN 25-APR-1996

DEFINITION H.vulgare Hor3 gene.

ACCESSION X84368

VERSION X84368.1 GI:671536

KEYWORDS D hordein; Hor3 gene.

SOURCE barley.

ORGANISM Hordeum vulgare  
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;  
Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae;  
Pooideae; Triticeae; Hordeum.

REFERENCE 1 (bases 1 to 1859)

AUTHORS Sorensen,M.B., Muller,M., Skerritt,J. and Simpson,D.

TITLE Hordein promoter methylation and transcriptional activity in  
wild-type and mutant barley endosperm

JOURNAL Mol. Gen. Genet. 250 (6), 750-760 (1996)

MEDLINE 96204516

REFERENCE 2 (bases 1 to 1859)

AUTHORS Sorensen,M.B.

TITLE Direct Submission

JOURNAL Submitted (01-FEB-1995) M.B. Sorensen, Carlsberg Laboratory,  
Department of Physiology, Gamle Carlsbergvej 1, DK-2500 Valby,  
DENMARK

COMMENT Sequence overlapping with that under the accession number X68072.

FEATURES

source 1..1859  
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/variety="Bomi"  
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/chromosome="5"  
/map="1H long arm"  
/clone="pHor3-1"  
/tissue\_type="endosperm"  
/clone\_lib="lambda Zap II"  
/dev\_stage="seed"

TATA\_signal 343..349

gene 435..1859  
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CDS 435..>1859  
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variation 1500

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1810  
variation /gene="Hor3"  
BASE COUNT 548 a 550 c 462 g 299 t  
ORIGIN

alignment\_scores:  
Quality: 86.00 Length: 20  
Ratio: 4.300 Gaps: 0  
Percent Similarity: 100.000 Percent Identity: 100.000

alignment\_block:  
US-09-538-864-4 x HVDNAHOR3 ..

Align seg 1/1 to: HVDNAHOR3 from: 1 to: 1859

1 AlaLysArgLeuValLeuPheValAlaValIleValAlaLeuValAlaLe 17  
|||||  
438 GCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTCGCCCTCGTGGCTCT 487  
  
17 uThrThrAla 20  
|||||  
488 CACCACCGCT 497

seq\_name: gb\_pl:BLYHOR3

## seq\_documentation\_block:

LOCUS BLYHOR3 2296 bp mRNA linear PLN 06-FEB-1999  
DEFINITION Barley Hor3 mRNA for D hordein, complete cds.  
ACCESSION D82941  
VERSION D82941.1 GI:1167497  
KEYWORDS D hordein; Hor3.  
SOURCE Hordeum vulgare (strain:Haruna Nijo) Seed Endosperm cDNA to mRNA,  
clone:DH4.  
ORGANISM Hordeum vulgare  
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;  
Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae;  
Pooideae; Triticeae; Hordeum.  
REFERENCE 1 (bases 1 to 2296)  
AUTHORS Hirota,N.  
TITLE Direct Submission  
JOURNAL Submitted (06-JAN-1996) Naohiko Hirota, Plant Bioengineering  
Research Laboratories,Sapporo breweries, Biotechnology department;  
Kizaki 37-1, Nitta, Gunma 370-03, Japan  
(E-mail:sapplant@po.infosphere.or.jp, Tel:0276-56-1455,  
Fax:0276-56-1605)  
REFERENCE 2 (bases 1 to 2296)  
AUTHORS Hirota,N., Kuroda,H. and Ito,K.  
JOURNAL Unpublished (1996)  
FEATURES Location/Qualifiers  
source 1. .2296  
/organism="Hordeum vulgare"  
/strain="Haruna Nijo"  
/db\_xref="taxon:4513"  
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/dev\_stage="Seed"  
gene 37. .2160  
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sig\_peptide 37. .120  
/gene="Hor3"  
CDS 37. .2160  
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mat\_peptide 121. .2157  
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/product="D hordein"  
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BASE COUNT      629 a      708 c      606 g      353 t  
ORIGIN

alignment\_scores:  
          Quality:   86.00                  Length:      20  
          Ratio:    4.300                  Gaps:        0  
Percent Similarity: 100.000  Percent Identity: 100.000

alignment\_block:  
US-09-538-864-4 x BLYHOR3  ..

Align seg 1/1  to: BLYHOR3  from: 1  to: 2296

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1 AlaLysArgLeuValLeuPheValAlaValIleValAlaLeuValAlaLe 17
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40 GCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTCGCCCTCGTGGCTCT 89
|||||
17 uThrThrAla 20
|||||
90 CACCACCGCT 99
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seq\_name: gb\_pat:BD005223

seq\_documentation\_block:

LOCUS      BD005223                  2380 bp      DNA      linear      PAT 31-JAN-2002  
DEFINITION  Method of production of barley reduced gel protein.  
ACCESSION   BD005223  
VERSION     BD005223.1  GI:18633184  
KEYWORDS    JP 03075311-T/2.  
SOURCE      unidentified.  
          ORGANISM  unidentified  
                  unclassified.  
REFERENCE   1  (bases 1 to 2380)  
AUTHORS     Hirota,N., Kihara,M. and Ito,K.  
TITLE       Method of production of barley reduced gel protein  
JOURNAL     Patent: JP 03075311-T 2 16-FEB-2001;  
             SAPPORO BREWERIES LTD,NAOHIKO HIROTA,MAKOTO KIHARA,KAZUTOSHI ITO  
COMMENT     OS  Hordenum vulgare (barley)  
             PN  JP 03075311-T/2  
             PD  16-FEB-2001  
             PF  16-AUG-2000 JP 2000005476  
             PR  16-AUG-1999 JP 99P  229696  
             PI  NAOHIKO HIROTA,MAKOTO KIHARA,KAZUTOSHI ITO  
             PC  A01H5/00,C12N15/10,C12N15/63  
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             FH  Key                  Location/Qualifiers  
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FEATURES     Location/Qualifiers  
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ORIGIN

alignment\_scores:

Quality:	86.00	Length:	20
Ratio:	4.300	Gaps:	0
Percent Similarity:	100.000	Percent Identity:	100.000

alignment\_block:

US-09-538-864-4 x BD005223 ..

Align seg 1/1 to: BD005223 from: 1 to: 2380

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27 GCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTCGCCCTCGTGGCTCT 76

17 uThrThrAla 20
| | | | | | | |
77 CACCACCGCT 86
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seq\_documentation\_block:

ID AAX34625 standard; DNA; 497 BP.

XX

AC AAX34625;

XX

DT 01-JUL-1999 (first entry)

XX

DE Barley D hordein promoter and signal sequence.

XX

KW Seed maturation-specific promoter; seed; transgenic plant; rice; barley;

KW maize; wheat; oat; rye; sorghum; millet; tricalate plant; insulin;

KW interferon; erythropoietin; interleukin; nutritional supplement;

KW grain quality; D hordein promoter; signal sequence; ss.

XX

OS Hordeum vulgare.

XX

FH Key Location/Qualifiers

FT CDS 434..497

FT /\*tag= a

FT /note= "fragment encoding barley D hordein  
FT signal peptide"

XX

PN WO9916890-A2.

XX

PD 08-APR-1999.

XX

PF 30-SEP-1998; 98WO-US20691.

XX

PR 30-SEP-1997; 97US-0060510.

XX

PA (REGC ) UNIV CALIFORNIA.

XX

PI Buchanan RB, Cho M, Lemaux PG;

XX

DR WPI; 1999-255099/21.

DR P-PSDB; AAY06898.

XX

PT New recombinant nucleic acid molecules

XX

PS Examples; Fig 5; 48pp; English.

XX

CC The invention relates to recombinant nucleic acid molecules which contain  
CC a seed maturation-specific promoter for expression of a selected  
CC polypeptide in seeds of transgenic plants. The novel recombinant nucleic  
CC acid molecule (NAM) has a structure P-X or P-SS-X, where X is a NAM  
CC encoding a polypeptide, P is a seed maturation-specific promoter, and SS  
CC is a signal sequence that targets a linked polypeptide to an  
CC intracellular body. The recombinant NAMs can be used for producing  
CC transgenic plants such as rice, barley, maize, wheat, oat, rye, sorghum,  
CC millet or tricalate plants. The transgenic plants can be used for  
CC producing a selected polypeptide in seeds of the plants. They can be  
CC used to produce polypeptides such as insulin, interferons, erythropoietin  
CC and interleukins, or nutritional supplements. Alternatively the  
CC polypeptide can improve the quality of grain. The present sequence  
CC represents the nucleic acid sequence of a barley D hordein promoter and  
CC signal sequence.

XX  
SQ Sequence 497 BP; 138 A; 150 C; 89 G; 120 T; 0 other;

alignment\_scores:  
Quality: 86.00 Length: 20  
Ratio: 4.300 Gaps: 0  
Percent Similarity: 100.000 Percent Identity: 100.000

alignment\_block:  
US-09-538-864-4 x AAX34625 ..

Align seg 1/1 to: AAX34625 from: 1 to: 497

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438 GCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTCGCCCTCGTGGCTCT 487

17 uThrThrAla 20
| | | | | | | |
488 CACCACCGCT 497
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seq\_name: /SIDS1/gcgdata/geneseq/geneseqn-embl/NA2000.DAT:AAC61536

seq\_documentation\_block:

ID AAC61536 standard; DNA; 497 BP.

XX

AC AAC61536;

XX

DT 19-FEB-2001 (first entry)

XX

DE Nucleotide sequence of the D-hordein promoter and signal sequence.

XX

KW Transgenic plant; thioredoxin; edible seed; food; feed; beverage;

KW allergenicity; germination rate; flour; malabsorption syndrome;

KW coeliac disease; sprue; catarrhal dysentery; brewing; malting;

KW industrial alcohol; food additive; D-hordein promoter; ss.

XX

OS Hordeum vulgare.

XX

FH Key Location/Qualifiers

FT promoter 1..434

FT /\*tag= a

FT sig\_peptide 435..497

FT /\*tag= b

XX

PN WO200058453-A2.

XX

PD 05-OCT-2000.

XX

PF 29-MAR-2000; 2000WO-US08315.

XX

PR 29-MAR-1999; 99US-0126736.

PR 31-MAR-1999; 99US-0127198.

PR 06-DEC-1999; 99US-0169162.

PR 21-JAN-2000; 2000US-0177739.

PR 21-JAN-2000; 2000US-0177740.

XX  
PA (REGC ) UNIV CALIFORNIA.  
XX  
PI Cho M, Lemaux PG, Buchanan BB, Wong J, Marx C;  
XX  
DR WPI; 2000-611708/58.  
XX  
PT Transgenic plants overexpressing thioredoxin protein, and their  
PT applications to enhance baking quality, digestibility, brewing and  
PT malting operations, and reduce allergenicity -  
XX  
PS Example 1; Fig 7; 103pp; English.  
XX  
CC The specification describes transgenic plants in which have an increased  
CC specific activity of thioredoxin compared to a non-transgenic plant of  
CC the same species. The transgenic plants provide edible seeds or grains  
CC for processing and consumption as food, feed, or beverage products by  
CC humans and other animals which have reduced allergenicity, increased  
CC digestibility, and improved germination rate. For humans, particular  
CC food products improved which can be improved include flour, as bread,  
CC pasta, cookies, and cake. The dough has increased strength and volume,  
CC improving baking qualities. Improved enzyme contents (pullulanase and  
CC amylase) improve digestibility of endogenous starches and proteins,  
CC reducing malabsorption syndromes in certain subjects (e.g., coeliac  
CC disease, sprue, and catarrhal dysentery patients), and allowing wider  
CC consumption. Fermentability, of application in the brewing and malting  
CC industries, and for production of industrial alcohol and malt as such,  
CC is also improved. Products from transgenic plants may also be used as  
CC food additives. The present sequence represents the barley  
CC endosperm-specific D-hordein promoter and the signal sequence. It is  
CC used in the course of the invention, to produce transgenic plants.  
XX  
SQ Sequence 497 BP; 138 A; 150 C; 89 G; 120 T; 0 other;

alignment\_scores:  
Quality: 86.00 Length: 20  
Ratio: 4.300 Gaps: 0  
Percent Similarity: 100.000 Percent Identity: 100.000

alignment\_block:  
US-09-538-864-4 x AAC61536 ..

Align seg 1/1 to: AAC61536 from: 1 to: 497

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17 uThrThrAla 20  
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488 CACCACCGCT 497

seq\_name: /SIDS1/gcgdata/geneseq/geneseqn-embl/NA2000.DAT:AAC62462

seq\_documentation\_block:  
ID AAC62462 standard; cDNA; 497 BP.



XX  
 AC AAC62462;  
 XX  
 DT 07-FEB-2001 (first entry)  
 XX  
 DE Barley D-hordein promoter and signal sequence.  
 XX  
 KW Barley; thioredoxin h; disulfide bridge reduction; development; NTR;  
 KW hair care product; venom neutralisation; food technology; food allergy;  
 KW NADPH-redoxin reductase; ss.  
 XX  
 OS Hordeum vulgare.  
 XX  
 PN WO200058352-A2.  
 XX  
 PD 05-OCT-2000.  
 XX  
 PF 31-MAR-2000; 2000WO-US08566.  
 XX  
 PR 31-MAR-1999; 99US-0127198.  
 PR 06-DEC-1999; 99US-0169162.  
 PR 21-JAN-2000; 2000US-0177739.  
 PR 21-JAN-2000; 2000US-0177740.  
 XX  
 PA (REGC ) UNIV CALIFORNIA.  
 XX  
 PI Cho M, Del Val G, Caillau M, Lemaux PG, Buchanan BB;  
 XX  
 DR WPI; 2000-679291/66.  
 XX  
 PT Recombinant or isolated nucleic acid, useful for producing transgenic  
 PT plants with altered redox properties, encode thioredoxin h or  
 PT thioredoxin reductase -  
 XX  
 PS Disclosure; Fig 12; 125pp; English.  
 XX  
 CC The present invention relates to the isolation and use of the barley  
 CC thioredoxin h and NADPH-redoxin reductase coding and protein sequences.  
 CC Thioredoxin is thought to be involved in plant development via its  
 CC function in the reduction of disulfide bridges. Thioredoxin can be used  
 CC in hair care products and in the neutralisation of some venoms and  
 CC toxins, and is also useful in the reduction of some food, for example it  
 CC can be used to reduce the allergenicity of foods and the digestibility  
 CC of some proteins. It can also be used to enhance the baking qualities of  
 CC cereal flour.  
 XX  
 SQ Sequence 497 BP; 138 A; 150 C; 89 G; 120 T; 0 other;

alignment\_scores:

Quality:	86.00	Length:	20
Ratio:	4.300	Gaps:	0
Percent Similarity:	100.000	Percent Identity:	100.000

alignment\_block:

US-09-538-864-4 x AAC62462 ..

Align seg 1/1 to: AAC62462 from: 1 to: 497

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438 GCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTCGCCCTCGTGGCTCT 487

17 uThrThrAla 20  
|||||  
488 CACCACCGCT 497

seq\_name: /SIDS1/gcgdata/geneseq/geneseqn-embl/NA1998.DAT:AAV20662

seq\_documentation\_block:

ID AAV20662 standard; DNA; 2296 BP.

XX

AC AAV20662;

XX

DT 23-JUN-1998 (first entry)

XX

DE Barley D-hordein gene 5'-terminal region.

XX

KW Barley; D-hordein; DPP3; promoter; gene expression; regulation;

KW seed; structural gene; ds.

XX

OS Hordeum vulgare.

XX

PN WO9803655-A2.

XX

PD 29-JAN-1998.

XX

PF 22-JUL-1997; 97WO-JP02526.

XX

PR 23-JUL-1996; 96JP-0193433.

XX

PA (SAPB ) SAPPORO BREWERIES.

XX

PI Hirota N, Ito K, Kihara M, Kuroda H;

XX

DR WPI; 1998-120779/11.

XX

PT Gene expression regulatory DNA, expression cassettes and vectors -

PT comprising promoter region from barley, Hordeum vulgare, D-hordein

PT gene, useful to control expression of desired gene e.g. to improve

PT seeds

XX

PS Example 3; Page 25-26; 42pp; English.

XX

CC The present sequence represents the 5'-terminal region of the barley

CC D-hordein gene. The present invention describes gene expression

CC regulatory DNA which comprises a promoter region derived from the

CC barley (Hordeum vulgare) D-hordein gene which allows expression of a

CC desired structural gene, and a regulatory region regulating such

CC expression. The introduction into plants of expression cassettes

CC containing the gene expression regulatory DNA (either directly or via

CC expression vectors) enables the expression of a gene within a plant cell

CC e.g. barley to be controlled. The use of activating and suppressing

CC regions in the regulatory DNA allows control of expression by e.g.

CC tissue type or developmental stage, whilst the use of only an activating  
CC region maintains expression at a high level, providing an effective  
CC production means when recovery of the product of the structural gene is  
CC desired. The expression cassette/vector may be introduced into e.g.  
CC maturing seed endosperm tissue or regeneratable plant cells (e.g. derived  
CC from anthers) to improve seeds of barley or other plants, to produce  
CC gene products in seeds or to contribute to plant breeding programmes.  
CC The expression regulatory DNA can also be used in expression systems in  
CC vitro. GUS activity in barley protoplasts transfected with plasmid  
CC DPP3GUS2 comprising isolated D-hordein promoter region was 1.5 times  
CC higher than in those transfected with control pACT1F.  
XX  
SQ Sequence 2296 BP; 629 A; 708 C; 606 G; 353 T; 0 other;

alignment\_scores:

Quality:	86.00	Length:	20
Ratio:	4.300	Gaps:	0
Percent Similarity:	100.000	Percent Identity:	100.000

alignment\_block:

US-09-538-864-4 x AAV20662 ..

Align seg 1/1 to: AAV20662 from: 1 to: 2296

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40 GCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTCGCCCTCGTGGCTCT 89

17 uThrThrAla 20
  ||||||||
90 CACCACCGCT 99
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seq\_name: /SIDS1/gcgdata/geneseq/geneseqn-embl/NA2001A.DAT:AAF63380

seq\_documentation\_block:

ID AAF63380 standard; cDNA; 2380 BP.

XX

AC AAF63380;

XX

DT 10-MAY-2001 (first entry)

XX

DE Barley cDNA involved in D-hordein production SEQ ID 2.

XX

KW Barley; gel protein; D-hordein; malt; wort filterability; extraction; ss.

XX

OS Hordeum vulgare.

XX

PN WO200111946-A1.

XX

PD 22-FEB-2001. X

XX

PF 16-AUG-2000; 2000WO-JP05476.

XX

PR 16-AUG-1999; 99JP-0229696.

XX

PA (SAPB ) SAPPORO BREWERIES LTD.

XX  
PI Hirota N, Kihara M, Ito K;  
XX  
DR WPI; 2001-191587/19.  
XX  
PT Transformation of barley with a D-hordein expression regulator for  
PT production of barley with lowered gel protein content -  
XX  
PS Claim 4; Page 33-34; 40pp; Japanese.  
XX  
CC This invention relates to barley having a low gel protein content. The  
CC barley is transformed with a polynucleotide sequence which regulated the  
CC formation of D-hordein. Transformation results in the production of  
CC barley strains with improved malting properties such as wort  
CC filterability and efficiency of extraction. The present sequence  
CC represents cDNA involved in the regulation of D-hordein production.  
XX  
SQ Sequence 2380 BP; 642 A; 747 C; 622 G; 369 T; 0 other;

alignment\_scores:

Quality:	86.00	Length:	20
Ratio:	4.300	Gaps:	0
Percent Similarity:	100.000	Percent Identity:	100.000

alignment\_block:

US-09-538-864-4 x AAF63380 ..

Align seg 1/1 to: AAF63380 from: 1 to: 2380

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27 GCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTCGCCCTCGTGGCTCT 76

17 uThrThrAla 20
| | | | | | | |
77 CACCACCGCT 86
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seq\_name: /SIDS1/gcgdata/geneseq/geneseqn-embl/NA2001A.DAT:AAF63379

seq\_documentation\_block:

ID AAF63379 standard; cDNA; 2434 BP.  
XX  
AC AAF63379;  
XX  
DT 10-MAY-2001 (first entry)  
XX  
DE Barley cDNA involved in D-hordein production SEQ ID 1.  
XX  
KW Barley; gel protein; D-hordein; malt; wort filterability; extraction; ss.  
XX  
OS Hordeum vulgare.  
XX  
PN WO200111946-A1.  
XX  
PD 22-FEB-2001. X  
XX

PF 16-AUG-2000; 2000WO-JP05476.  
XX  
PR 16-AUG-1999; 99JP-0229696.  
XX  
PA (SAPB ) SAPPORO BREWERIES LTD.  
XX  
PI Hirota N, Kihara M, Ito K;  
XX  
DR WPI; 2001-191587/19.  
XX  
PT Transformation of barley with a D-hordein expression regulator for  
PT production of barley with lowered gel protein content -  
XX  
PS Claim 4; Page 31-33; 40pp; Japanese.  
XX  
CC This invention relates to barley having a low gel protein content. The  
CC barley is transformed with a polynucleotide sequence which regulated the  
CC formation of D-hordein. Transformation results in the production of  
CC barley strains with improved malting properties such as wort  
CC filterability and efficiency of extraction. The present sequence  
CC represents cDNA involved in the regulation of D-hordein production.  
XX  
SQ Sequence 2434 BP; 675 A; 757 C; 626 G; 376 T; 0 other;

alignment\_scores:

Quality:	86.00	Length:	20
Ratio:	4.300	Gaps:	0
Percent Similarity:	100.000	Percent Identity:	100.000

alignment\_block:

US-09-538-864-4 x AAF63379 ..

Align seg 1/1 to: AAF63379 from: 1 to: 2434

```
1 AlaLysArgLeuValLeuPheValAlaValIleValAlaLeuValAlaLe 17
  ||||||||||||||||||||||||||||||||||||||||||||
40 GCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTCGCCCTCGTGGCTCT 89

17 uThrThrAla 20
  ||||||||
90 CACCACCGCT 99
```

seq\_name: /SIDS1/gcgdata/geneseq/geneseqn-embl/NA2002.DAT:AAI70852

seq\_documentation\_block:

ID AAI70852 standard; DNA; 1302 BP.  
XX  
AC AAI70852;  
XX  
DT 18-FEB-2002 (first entry)  
XX  
DE Wheat glutenin gene variant.  
XX  
KW Wheat; glutenin; storage protein; variant; transgenic plant;  
KW gluten; ds.  
XX



7 AAGCGGTTGGTTCTTTTTCGGCGGTAGTCGTCGCCCTTGTGGCTCTCAC 56

18 rThrAla 20

|:::|

57 CGCTGCT 63

seq\_documentation\_block:

; Sequence 2, Application US/08899336  
; Patent No. 5955649  
; GENERAL INFORMATION:  
; APPLICANT: HIROTA, NAHIKO  
; APPLICANT: KIHARA, MAKOTO  
; APPLICANT: KURODA, HISAO  
; APPLICANT: ITO, KAZUTOSHI  
; TITLE OF INVENTION: GENE EXPRESSION REGULATORY DNA,  
; TITLE OF INVENTION: EXPRESSION CASSETTE, EXPRESSION VECTOR AND TRANSGENIC  
; TITLE OF INVENTION: PLANT  
; NUMBER OF SEQUENCES: 8  
; CORRESPONDENCE ADDRESS:  
; ADDRESSEE: OBLON, SPIVAK, McCLELLAND, MAIER & NEUSTADT,  
; ADDRESSEE: P.C.  
; STREET: 1755 SOUTH JEFFERSON DAVIS HIGHWAY, SUITE 400  
; CITY: ARLINGTON  
; STATE: VIRGINIA  
; COUNTRY: U.S.A.  
; ZIP: 22202  
; COMPUTER READABLE FORM:  
; MEDIUM TYPE: Floppy disk  
; COMPUTER: IBM PC compatible  
; OPERATING SYSTEM: PC-DOS/MS-DOS  
; SOFTWARE: PatentIn Release #1.0, Version #1.30  
; CURRENT APPLICATION DATA:  
; APPLICATION NUMBER: US/08/899,336  
; FILING DATE: 23-JUL-1997  
; CLASSIFICATION: 800  
; PRIOR APPLICATION DATA:  
; APPLICATION NUMBER: JP HEI 8-193433  
; FILING DATE: 23-JUL-1996  
; ATTORNEY/AGENT INFORMATION:  
; NAME: OBLON, NORMAN F.  
; REGISTRATION NUMBER: 24,618  
; REFERENCE/DOCKET NUMBER: 2589-0061-0  
; TELECOMMUNICATION INFORMATION:  
; TELEPHONE: (703) 413-3000  
; TELEFAX: (703) 413-2220  
; INFORMATION FOR SEQ ID NO: 2:  
; SEQUENCE CHARACTERISTICS:  
; LENGTH: 2296 base pairs  
; TYPE: nucleic acid  
; STRANDEDNESS: double  
; TOPOLOGY: linear  
; MOLECULE TYPE: DNA (genomic)  
US-08-899-336-2

checked  
Ø

alignment\_scores:

Quality:	86.00	Length:	20
Ratio:	4.300	Gaps:	0
Percent Similarity:	100.000	Percent Identity:	100.000

alignment\_block:

US-09-538-864-4 x US-08-899-336-2 ..



Align seg 1/1 to: US-08-899-336-2 from: 1 to: 2296

```
1 AlaLysArgLeuValLeuPheValAlaValIleValAlaLeuValAlaLe 17
  |||
40 GCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTCGCCCTCGTGGCTCT 89

17 uThrThrAla 20
  |||
90 CACCACCGCT 99
```

seq\_documentation\_block:

ID AAX34624 standard; DNA; 486 BP.

XX

AC AAX34624;

XX

DT 01-JUL-1999 (first entry)

XX

DE Barley B1 hordein promoter and signal sequence.

XX

KW Seed maturation-specific promoter; seed; transgenic plant; rice; barley;

KW maize; wheat; oat; rye; sorghum; millet; tricalate plant; insulin;

KW interferon; erythropoietin; interleukin; nutritional supplement;

KW grain quality; B1 hordein promoter; signal sequence; ss.

XX

OS Hordeum vulgare.

XX

FH Key Location/Qualifiers

FT CDS 430..486

FT /\*tag= a

FT /note= "fragment encoding barley B1 hordein  
FT signal peptide"

XX

PN WO9916890-A2.

XX

PD 08-APR-1999.

XX

PF 30-SEP-1998; 98WO-US20691.

XX

PR 30-SEP-1997; 97US-0060510.

XX

PA (REGC ) UNIV CALIFORNIA.

XX

PI Buchanan RB, Cho M, Lemaux PG;

XX

DR WPI; 1999-255099/21.

DR P-PSDB; AAY06897.

XX

PT New recombinant nucleic acid molecules

XX

PS Examples; Fig 3; 48pp; English.

XX

CC The invention relates to recombinant nucleic acid molecules which contain  
CC a seed maturation-specific promoter for expression of a selected  
CC polypeptide in seeds of transgenic plants. The novel recombinant nucleic  
CC acid molecule (NAM) has a structure P-X or P-SS-X, where X is a NAM  
CC encoding a polypeptide, P is a seed maturation-specific promoter, and SS  
CC is a signal sequence that targets a linked polypeptide to an  
CC intracellular body. The recombinant NAMs can be used for producing  
CC transgenic plants such as rice, barley, maize, wheat, oat, rye, sorghum,  
CC millet or tricalate plants. The transgenic plants can be used for  
CC producing a selected polypeptide in seeds of the plants. They can be  
CC used to produce polypeptides such as insulin, interferons, erythropoietin  
CC and interleukins, or nutritional supplements. Alternatively the  
CC polypeptide can improve the quality of grain. The present sequence  
CC represents the nucleic acid sequence of a barley B1 hordein promoter and  
CC signal sequence.

XX

SQ Sequence 486 BP; 176 A; 107 C; 79 G; 124 T; 0 other;

alignment\_scores:

Quality: 85.00 Length: 19  
Ratio: 4.474 Gaps: 0  
Percent Similarity: 100.000 Percent Identity: 100.000

alignment\_block:

US-09-538-864-2 x AAX34624 ..

Align seg 1/1 to: AAX34624 from: 1 to: 486

1 MetLysThrPheLeuIlePheAlaLeuLeuAlaIleAlaAlaThrSerTh 17  
|||||  
430 ATGAAGACCTTCCTCATCTTTGCACTCCTCGCCATTGCGGCAACAAGTAC 479  
  
17 rIleAla 19  
|||||  
480 GATTGCA 486

seq\_name: /SIDS1/gcgdata/geneseq/geneseqn-embl/NA2000.DAT:AAC61535

seq\_documentation\_block:

ID AAC61535 standard; DNA; 486 BP.

XX

AC AAC61535;

XX

DT 19-FEB-2001 (first entry)

XX

DE Nucleotide sequence of the D-hordein promoter and signal sequence.

XX

KW Transgenic plant; thioredoxin; edible seed; food; feed; beverage;

KW allergenicity; germination rate; flour; malabsorption syndrome;

KW coeliac disease; sprue; catarrhal dysentery; brewing; malting;

KW industrial alcohol; food additive; D-hordein promoter; ss.

XX

OS Hordeum vulgare.

XX

FH Key Location/Qualifiers

FT promoter 1..429

FT /\*tag= a

FT sig\_peptide 430..486

FT /\*tag= b

XX

PN WO200058453-A2.

XX

PD 05-OCT-2000.

XX

PF 29-MAR-2000; 2000WO-US08315.

XX

PR 29-MAR-1999; 99US-0126736.

PR 31-MAR-1999; 99US-0127198.

PR 06-DEC-1999; 99US-0169162.

PR 21-JAN-2000; 2000US-0177739.

PR 21-JAN-2000; 2000US-0177740.

XX

PA (REGC ) UNIV CALIFORNIA.  
 XX  
 PI Cho M, Lemaux PG, Buchanan BB, Wong J, Marx C;  
 XX  
 DR WPI; 2000-611708/58.  
 XX  
 PT Transgenic plants overexpressing thioredoxin protein, and their  
 PT applications to enhance baking quality, digestibility, brewing and  
 PT malting operations, and reduce allergenicity -  
 XX  
 PS Example 1; Fig 6; 103pp; English.  
 XX  
 CC The specification describes transgenic plants in which have an increased  
 CC specific activity of thioredoxin compared to a non-transgenic plant of  
 CC the same species. The transgenic plants provide edible seeds or grains  
 CC for processing and consumption as food, feed, or beverage products by  
 CC humans and other animals which have reduced allergenicity, increased  
 CC digestibility, and improved germination rate. For humans, particular  
 CC food products improved which can be improved include flour, as bread,  
 CC pasta, cookies, and cake. The dough has increased strength and volume,  
 CC improving baking qualities. Improved enzyme contents (pullulanase and  
 CC amylase) improve digestibility of endogenous starches and proteins,  
 CC reducing malabsorption syndromes in certain subjects (e.g., coeliac  
 CC disease, sprue, and catarrhal dysentery patients), and allowing wider  
 CC consumption. Fermentability, of application in the brewing and malting  
 CC industries, and for production of industrial alcohol and malt as such,  
 CC is also improved. Products from transgenic plants may also be used as  
 CC food additives. The present sequence represents the barley  
 CC endosperm-specific D-hordein promoter and the signal sequence. It is  
 CC used in the course of the invention, to produce transgenic plants.  
 XX  
 SQ Sequence 486 BP; 176 A; 107 C; 79 G; 124 T; 0 other;

alignment\_scores:  
     Quality: 85.00                      Length: 19  
     Ratio: 4.474                      Gaps: 0  
 Percent Similarity: 100.000    Percent Identity: 100.000

alignment\_block:  
 US-09-538-864-2 x AAC61535 ..

Align seg 1/1 to: AAC61535 from: 1 to: 486

1 MetLysThrPheLeuIlePheAlaLeuLeuAlaIleAlaAlaThrSerTh 17  
 |||||  
 430 ATGAAGACCTTCCTCATCTTTGCACTCCTCGCCATTGCGGCAACAAGTAC 479  
 17 rIleAla 19  
 |||||  
 480 GATTGCA 486

seq\_name: /SIDS1/gcgdata/geneseq/geneseqn-embl/NA2000.DAT:AAC62461

seq\_documentation\_block:  
 ID AAC62461 standard; cDNA; 486 BP.  
 XX

AC AAC62461;  
 XX  
 DT 07-FEB-2001 (first entry)  
 XX  
 DE Barley B1-hordein promoter and signal sequence.  
 XX  
 KW Barley; thioredoxin h; disulfide bridge reduction; development; NTR;  
 KW hair care product; venom neutralisation; food technology; food allergy;  
 KW NADPH-redoxin reductase; ss.  
 XX  
 OS Hordeum vulgare.  
 XX  
 PN WO200058352-A2.  
 XX  
 PD 05-OCT-2000.  
 XX  
 PF 31-MAR-2000; 2000WO-US08566.  
 XX  
 PR 31-MAR-1999; 99US-0127198.  
 PR 06-DEC-1999; 99US-0169162.  
 PR 21-JAN-2000; 2000US-0177739.  
 PR 21-JAN-2000; 2000US-0177740.  
 XX  
 PA (REGC ) UNIV CALIFORNIA.  
 XX  
 PI Cho M, Del Val G, Caillau M, Lemaux PG, Buchanan BB;  
 XX  
 DR WPI; 2000-679291/66.  
 XX  
 PT Recombinant or isolated nucleic acid, useful for producing transgenic  
 PT plants with altered redox properties, encode thioredoxin h or  
 PT thioredoxin reductase -  
 XX  
 PS Example 3; Fig 11; 125pp; English.  
 XX  
 CC The present invention relates to the isolation and use of the barley  
 CC thioredoxin h and NADPH-redoxin reductase coding and protein sequences.  
 CC Thioredoxin is thought to be involved in plant development via its  
 CC function in the reduction of disulfide bridges. Thioredoxin can be used  
 CC in hair care products and in the neutralisation of some venoms and  
 CC toxins, and is also useful in the reduction of some food, for example it  
 CC can be used to reduce the allergenicity of foods and the digestibility  
 CC of some proteins. It can also be used to enhance the baking qualities of  
 CC cereal flour.  
 XX  
 SQ Sequence 486 BP; 176 A; 107 C; 79 G; 124 T; 0 other;

alignment\_scores:

Quality:	85.00	Length:	19
Ratio:	4.474	Gaps:	0
Percent Similarity:	100.000	Percent Identity:	100.000

alignment\_block:

US-09-538-864-2 x AAC62461 ..

Align seg 1/1 to: AAC62461 from: 1 to: 486

1 MetLysThrPheLeuIlePheAlaLeuLeuAlaIleAlaAlaThrSerTh 17  
|||||  
430 ATGAAGACCTTCCTCATCTTTGCACTCCTCGCCATTGCGGCAACAAGTAC 479

17 rIleAla 19  
|||||  
480 GATTGCA 486

100% SID 2

seq\_documentation\_block:

LOCUS HVB1HOR2 1775 bp DNA linear PLN 22-MAY-1995  
 DEFINITION H.vulgare B1 hordein gene.  
 ACCESSION X87232  
 VERSION X87232.1 GI:809030  
 KEYWORDS B1 hordein; Hor2-4 gene.  
 SOURCE barley.  
 ORGANISM Hordeum vulgare  
 Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;  
 Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae;  
 Pooideae; Triticeae; Hordeum.  
 REFERENCE 1 (bases 1 to 1775)  
 AUTHORS Brandt,A., Montembault,A., Cameron Mills,V. and Rasmussen,S.  
 TITLE Primary structure of a B1 hordein gene from barley  
 JOURNAL Carlsberg Res. Commun. 50, 333-345 (1985)  
 FEATURES Location/Qualifiers  
 source 1. .1775  
 /organism="Hordeum vulgare"  
 /cultivar="Carlsberg II"  
 /db\_xref="taxon:4513"  
 /chromosome="5"  
 /clone="hor2-4"  
 /clone\_lib="lambda L47.1"  
 /dev\_stage="immature endosperm"  
 repeat\_region join(115. .124,248. .257)  
 /rpt\_unit=115. .124  
 CAAT\_signal 422. .425  
 TATA\_signal 472. .475  
 gene 551. .1366  
 /gene="hor2-4"  
 CDS 551. .1366  
 /gene="hor2-4"  
 /codon\_start=1  
 /product="B1 hordein"  
 /protein\_id="CAA60681.1"  
 /db\_xref="GI:809031"  
 /db\_xref="SPTREMBL:Q40021"  
 /translation="MKTFLIFALLAIAATSTIAQQQPFPPQPIQQPQPYPPQPPQYP  
 QQFFPPQQAFFPQQPPFWPQQPPFQQPPFGLQQPILSQQQPCTPQPTPLPQGQLYQTLL  
 QLQIPYVQPSILQQLTPCKVFLQQQCSFVRMPQLIARSQMLQQSSCHVLQQQCCQQLP  
 QIQEQFRHEAIRAIVYSIFLQEQPQQSVQGASQPQQQLQEEQVGGQCYFQQPQPQQQLGQ  
 PQQVPQSVFLQPHQIAQLEATNSIALRTLPTMCNVNVPLYDIMPFVGVGTRVGV"  
 mat\_peptide 605. .1363  
 /gene="hor2-4"  
 /product="B1 hordein"  
 polyA\_signal 1433. .1438  
 polyA\_signal 1491. .1496  
 polyA\_signal 1501. .1506  
 BASE COUNT 573 a 473 c 305 g 424 t  
 ORIGIN

alignment\_scores:

Quality: 85.00 Length: 19  
 Ratio: 4.474 Gaps: 0  
 Percent Similarity: 100.000 Percent Identity: 100.000

alignment\_block:

US-09-538-864-2 x HVB1HOR2 ..

Align seg 1/1 to: HVB1HOR2 from: 1 to: 1775

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      1 MetLysThrPheLeuIlePheAlaLeuLeuAlaIleAlaAlaThrSerTh 17
      ||||||||||||||||||||||||||||||||||||||||||||||||
551 ATGAAGACCTTCCTCATCTTTGCACTCCTCGCCATTGCGGCAACAAGTAC 600

      17 rIleAla 19
      |||||||
601 GATTGCA 607
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seq\_name: gb\_pl:HVB1HOR2

seq\_documentation\_block:

LOCUS HVB1HOR2 2900 bp DNA linear PLN 21-MAR-1995  
DEFINITION Barley gene for B1 hordein.  
ACCESSION X03103  
VERSION X03103.1 GI:18909  
KEYWORDS direct repeat; hordein; prolamin; seed storage protein; signal peptide; storage protein.  
SOURCE barley.  
ORGANISM Hordeum vulgare  
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Pooideae; Triticeae; Hordeum.  
REFERENCE 1 (bases 1 to 2900)  
AUTHORS Forde,B.G., Heyworth,A., Pywell,J. and Kreis,M.  
TITLE Nucleotide sequence of a B1 hordein gene and the identification of possible upstream regulatory elements in endosperm storage protein genes from barley, wheat and maize  
JOURNAL Nucleic Acids Res. 13 (20), 7327-7339 (1985)  
MEDLINE 86041918  
FEATURES  
source Location/Qualifiers  
1..2900  
/organism="Hordeum vulgare"  
/db\_xref="taxon:4513"  
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misc\_feature 1..22  
/note="put. regulatory region"  
misc\_feature 262..295  
/note="put. regulatory region"  
repeat\_region 275..292  
/note="imp. direct repeat"  
misc\_feature 426..435  
/note="put. regulatory region, CATC-box"  
promoter 485..492  
/note="put. TATA-box"  
precursor\_RNA 513..1579  
/note="put. primary transcript"  
CDS 564..1445  
/note="precursor"  
/codon\_start=1  
/protein\_id="CAA26889.1"  
/db\_xref="GI:18910"



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/db_xref="SWISS-PROT:P06470"
/translation="MKTFLIFALLAIAATSTIAQQQPFPPQQPIPQQPQPYPPQQPQYP
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ARSQMLQQSSCHVLQQCCQQLPQIPEQFRHEAIRAIVYSIFLQEQPQQLVGVVSQPO
QQLWPPQQVGQCSFQQPQPPQQVGQQQVPQSAFLQPHQIAQLEATTSLALRTLPMPCSV
NVPLYRILRGVGPSVGV"
sig_peptide      564. .620
                  /note="putative"
mat_peptide      621. .1442
                  /product="mature B1 hordein (aa 1-274)"
misc_feature     1499. .1504
                  /note="pot. polyadenylation signal"
misc_feature     1556. .1561
                  /note="pot. polyadenylation signal"
misc_feature     1567. .1572
                  /note="pot. polyadenylation signal"
polyA_site       1579
                  /note="put. polyadenylation site"
BASE COUNT      938 a    763 c    495 g    704 t
ORIGIN

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alignment_scores:
    Quality:      85.00          Length:      19
    Ratio:        4.474          Gaps:         0
Percent Similarity: 100.000    Percent Identity: 100.000

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```

alignment_block:
US-09-538-864-2 x HVB1HORG  ..

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Align seg 1/1 to: HVB1HORG from: 1 to: 2900

```

    1 MetLysThrPheLeuIlePheAlaLeuLeuAlaIleAlaAlaThrSerTh 17
      ||||||||||||||||||||||||||||||||||||||||||||
564 ATGAAGACCTTCCTCATCTTTGCACTCCTCGCCATTGCGGCAACAAGTAC 613

    17 rIleAla 19
      |||||||
614 GATTGCG 620

```

seq\_name: gb\_pl:HVBH047